CE

Model Number

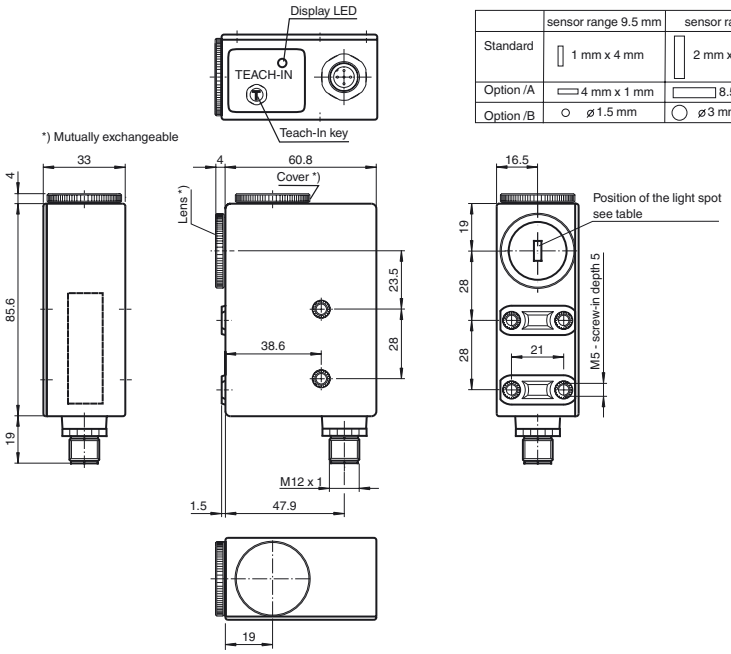
DF20/B/49/124

Print mark color sensor
with 5-pin, M12 x 1 connector

Features

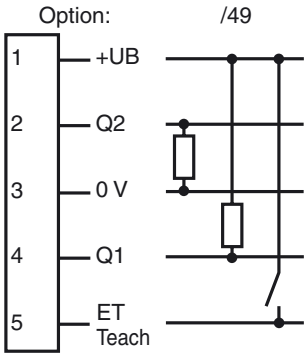
- Diffuse mode sensor for recording colored print marks on backgrounds with different colors
- TEACH-IN procedure for automatic threshold value setting
- 3 emitter colors: green, red and blue
- Very short response time
- Optical system exchangeable by 90°
- Sturdy, waterproof plastic housing

Dimensions

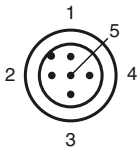


	sensor range 9.5 mm	sensor range 25 mm
Standard	1 mm x 4 mm	2 mm x 8.5 mm
Option /A	4 mm x 1 mm	8.5 mm x 2 mm
Option /B	ø1.5 mm	ø3 mm

Electrical connection



Pinout

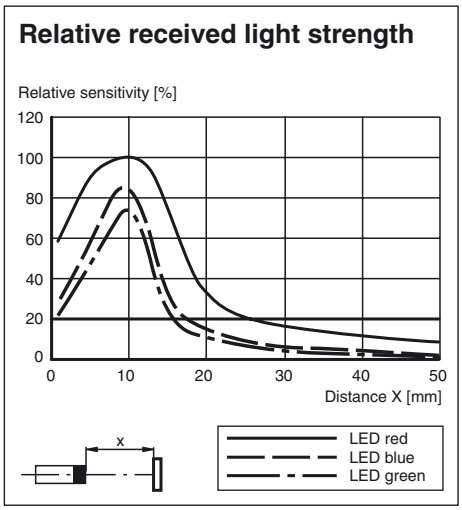


Release date: 2013-09-25 09:45 Date of issue: 2013-10-15 421388_eng.xml

Technical data

General specifications		
Sensor range		9.5 mm ± 2 mm
Light source		3 LEDs (R,G,B)
Light type		Visible green/red/blue, modulated light
Light spot representation		Light spot diameter 1.5 mm
Angle deviation		max. ± 3°
Functional safety related parameters		
$MTTF_d$		650 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Indicators/operating means		
Function indicator		LED yellow, lights up if print mark is detected flashes, if no safe operation is possible
Control elements		Teach-In key
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	≤ 55 mA
Input		
Function input		Teach-In input
Output		
Switching type		PNP switches according to $+U_B$, NPN according to 0 V for detected mark
Signal output		1 PNP and 1 NPN short-circuit protected, open collector, synchronized-switching
Switching voltage		PNP: ≥ ($+U_B$ -2.5 V) , NPN: ≤ 1.5 V
Switching current		max. 200 mA
Switching frequency	f	1.65 kHz
Response time		300 µs
Standard conformity		
Standards		EN 60947-5-2
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-20 ... 75 °C (-4 ... 167 °F)
Mechanical specifications		
Protection degree		IP67
Connection		M12 x 1 connector, 5-pin
Material		
Housing		PC (glass-fiber-reinforced Makrolon)
Optical face		glass
Mass		200 g
Approvals and certificates		
CCC approval		CCC approval / marking not required for products rated ≤36 V
Approvals		CE

Relative received light strength



Function

Accessories

V15-G-2M-PUR
Female cordset, M12, 5-pin, PUR cable

V15-W-2M-PUR
Female cordset, M12, 5-pin, PUR cable

Other suitable accessories can be found at www.pepperl-fuchs.com

Release date: 2013-09-25 09:45 Date of issue: 2013-10-15 421388_eng.xml

The colour sensor DF 20 operates according to the „active three-range procedure“. This means that its three transmission LEDs are switched one after the other and are evaluated individually. The light of the three different emitters is reflected from colored objects with different intensities. The reflected light of the individual emitters causes three different reception signals that are compared with the programmed (teach-in) values. Only if all three values (red, green and blue transmission light) correspond with the teach-in values both the switching outputs and the indicator LED will be activated. The reference values are stored in non-volatile memory and are thus available each time the DF20 is put into operation.

Arrangement

The device is equipped with an exchangeable optical system that can be screwed onto the front or the side of the print mark sensor depending on the application.

Setting

TEACH-IN procedure

Align the light spot to the print mark. For reflective or shiny objects, the sensor should be inclined to the surface of the material by 10° to 15°.
The TEACH-IN key on the device confirms whether a positive pulse (UB+) was present on the external TEACH-In input for at least 50 ms, the DF20 evaluates the reception signals of the individual transmitters and saves these in non-volatile memory.
After the TEACH-IN signal is complete, the DF20 detects the programmed print mark and activates the two switching outputs. The display LED lights statically.

Alarm function

The display-LED of the DF20 flashes if no evaluation of the colour programmed with TEACH-IN is possible. You can return to switching operation by pressing a key or by using an external TEACH-IN signal.

Emitter test function

If an emitter test function needs to be performed, the TEACH-IN key must be held down while voltage is applied and then released again.
If the TEACH-IN key is pressed again, the green LED lights up, then the red LED during the next TEACH-IN and after that the blue LED. After testing the 3 transmission LEDs, the TEACH-IN key is pressed one more time and the device is back in switching operation with the last TEACH-IN values. Switching of outputs is suppressed in direct detection mode.

Release date: 2013-09-25 09:45 Date of issue: 2013-10-15 421388_eng.xml